REMARKS

Reconsideration of this application, in view of the foregoing amendments and the following remarks, is respectfully requested.

Claim Rejections - 35 USC § 103

Claims 1-11,13,14,16-31 rejected under 35 U.S.C. 103(a) as being unpatentable over Youssefmir et al. (6795409) and further in view of Raleigh (6006110). Applicant respectfully traverses these rejections.

There are three basic criteria to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a). First, there must be some suggestion or motivation in the cited references to modify or combine their teachings; second, there must be reasonable expectation of success; and third, the prior art references must teach or suggest all the claim limitations. *See* M.P.E.P §2142. As to claim 1, the combination of Youssefmir et al. and Raleigh does not teach each and every limitation of the claim 1.

As to claim 1, the Examiner has cited col. 27, lines 43-55 of Youssefmir et al. and stated that

> "The system **may use** pilot tones sent with each data packet in order to determine weighting factors (**for noise mitigation**) for the base station (Col 27 lines 43-55). When training tones are used, the system inherently comprises a training tone extractor to extract training tones from the received data signal." (Emphasis added)

Applicants respectfully point to the Examiner that a careful reading of the cited sections reveals that Youssefmir et al. refers to the training tones used in acknowledgement packets received from a user terminal. According to Youssefmir et al., the training data in the acknowledgement includes identification information to identify a user terminal for a particular base station (*see* col. 19, line 60 – col. 20, line 6, figures 3B and 4B and corresponding description).

Further as to weighting factors for noise mitigation as the Examiner has stated, Applicants respectfully point to the Examiner that Youssefmir et al. refers to weighting factors for combining various signals received thorough multiple antennas to determine a best possible combination of these signals for smart antenna processing. According to Youssefmir et al., the received signals are weighted in amplitude and phase according to a set of uplink weighting parameters to advantageously combine these signals (*see* col. 5, lines 7-24). Thus, the weighting parameters in Youssefmir et al. are not for noise mitigation as the Examiner has asserted.

Furthermore as to the training tone extractor, as explained above, Youssefmir et al. uses training data to identify signals from various user terminals to identify a right match of base station and user station. The training data is part of an acknowledgement packet and the training data is processed as part of the received data processing. Youssefmir et al. does not use the training data separately thus, there is no need for training data extractor and Youssefmir et al. does not teach, suggest, or describe any other use of the training data. Even the Examiner has also observed that "Youssefmir does not disclose the specifics of the antenna training including a noise estimator computing a noise estimation based on the training signals." Youssefmir et al. does not show a noise estimator because the entire smart antenna processing strategy of Youssefmir et al. is based on increasing the signal-to-noise ratio and/or reducing interference. Thus, a separate noise estimator is not compatible with the smart antenna processing strategy of Youssefmir et al.

Furthermore citing Raleigh, the Examiner has stated that "[t]he system further comprises a **noise estimator (Col 8 lines *35-45)* to estimate the noise (SNR)** of the received signals (Col 8 lines 10-25)" (Emphasis added). Applicant respectfully disagrees and points to the Examiner that in the cited sections, Raleigh does not disclose a noise estimator instead Raleigh describes an alternate embodiment in which statistical characterization of a mobile unit can be used to "determine the **beam pattern weight vector** which maximizes a predetermined quality parameter (e.g., signal to noise ratio of the signal received in the intended base station(s), while minimizing signal transition to other base stations." (Col. 8, lines 35-45, emphasis added). Thus, Raleigh does not disclose noise estimator as recited in claim 1.

Furthermore, Applicant respectfully points to the Examiner that claim 1 specifically recites noise estimator for computing noise estimation for training tones that have been isolated from other tones. In contrast, the Examiner has generally cited statistical characterization of channel vector for noise calculation in Raleigh and combined it with data tones in the acknowledgement packets from user terminal in Youssefmir et al. "The fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness." *See* MPEP §2143.01. Accordingly, the combination of Raleigh and Youssefmir et al. do not show, teach, or suggest every limitation of claim 1.

Claims 2-13 depend from claim 1 and are patentably distinguishable from the combination of cited references for at least the same reasons as claim 1.

Further as to claim 2, the Examiner has stated that "As per claims 2, 26, the noise estimator computes the difference (error signal) between a **received training signal** and a **previous training signal** (RALEIGH: Col 15 lines 25-40)." (Emphasis added). Applicant respectfully disagrees and points to the Examiner that in the cited sections, Raleigh does not describe any processing using training signals. In fact, Raleigh describes an equalization algorithm, which includes the entire signal. For example, in step 2 of the algorithm (col. 15, line 30), Raleigh estimates the present channel state using equations 25 and 27, where equation 25 actually provides "a true channel **plus** noise measurement model" (*see* col. 16, lines 17-18). Thus, Raleigh does not compute a first indication of the difference between an indexed training tone in one burst relative to the indexed training tone in a preceding burst as recited in claim 2. Furthermore, claim 2 recites that the noise estimator further comprising a first noise estimation portion. The Examiner has not cited this limitation in either of the references. Thus, the combination of cited references does not teach or suggest all limitations of claim 2. Accordingly, claim 2 is further patentably distinguishable from the combination of cited references.

In rejecting claim 3 in the manner of claim 16, the Examiner has stated that "[s]ince the system relies upon **a serial bitstream** to recover the data and training tones, the system inherently comprises a selector (indexing function) (such as a timing clock signal) to determine the predetermined spacing of data signals and training signals (such as is defined in Youssefmir Fig. 5C, 5D)" (Emphasis added). Applicant respectfully points to the Examiner that the

Examiner has not cited any reference in Raleigh or in Youssefmir et al. that supports this assumption. Further, the cited figures in Youssefmir et al. include structure of an acknowledge frame and as explained above, it includes identification information to match-up user terminal with the proper base station. In contrast, claim 3 recites an index operative to index through the training tones that have been isolated from other tones. Neither Raleigh not Youssefmir et al. teach this limitation. In fact, neither of the cited references describes indexing through any received signal. Accordingly, claim 3 is further patentably distinguishable from the combination of cited references.

As to claim 4, Applicants respectfully points to the Examiner that claim 4 recites that the noise estimator further comprising **a second noise estimation portion**. The Examiner has not cited any reference that teaches this limitation instead the Examiner has stated that "the system calculates the variance and covariance (RALEIGH: Col 11 lines 40-56)." As explained above, to establish a *prima facie* case of obviousness, the cited references must teach all limitations of the claim. Here, the combination of cited references do not teach, suggest, or describe a second noise estimation portion as recited in claim 4. Accordingly, claim 4 is further patentably distinguishable from the combination of cited references.

As to claim 5, the Examiner has stated that "the **system time averages** the covariance (RALEIGH: Col 15 lines 1-10)." (Emphasis added). Applicants respectfully point to the Examiner that first, in the cited sections, Raleigh describes various problems with algorithm of which, one being the false signal tracking. Raleigh states that false tracking can be reduced with a time average interference covariance solution (*see* col. 15, lines 2-9). Second, claim 5 recites a distinct element: a time averager that is operative to average the **second indication computed by the second noise estimation portion**. As explained above, neither of the cited references teaches, suggests, or describes a second noise estimation portion. Further, the time average function described in claim 5 is specific to the second noise estimation portion, neither of these limitations are taught by cited references. Accordingly, claim 5 is further patentably distinguishable from the combination of cited references.

Claims 6-8 have been generally rejected in the manner of claim 16. Applicant respectfully requests the Examiner a careful reading of claim 6. Claim 6 recites performing

beamforming computations for a plurality of tones of the at least one other type of tone **based on** the computed noise estimation for the training tone **nearest each respective tone** of the plurality of tones of the at least one other type of tone. This specific computation is not taught by any of the cited references. In fact, neither of the cited references describes beamforming computations as recited in claim 6. Accordingly, claims 6-8 are further patentably distinguishable from the combination of cited references.

As to claim 9, the Examiner has stated that "Youssefmir discloses (Fig. 5D) that each data packet is sent with an **associated** training signal adjacent to the data packet (nearest to)." Applicant respectfully points to the Examiner that as even the Examiner has observed that in Youssefmir et al., the data packet includes the training signal thus there is no option of selecting a training tone nearest to the indexed data tone as recited in claim 9. In Youssefmir et al., the training tone actually identifies the user terminal and base station for the associated data thus, a different one of the training tone cannot be used for the data tone. Accordingly, claim 9 is clearly further patentably distinguishable from the combination of cited references.

Claim 14 has been rejected in the manner of claim 1. Accordingly, claim 14 is patentably distinguishable from the combination of cited references for at least the same reasons as claim1. Further, claim 14 clearly recites that the first type of carrier signal being interspersed throughout the received signal and fewer in number than the other carrier signals. Neither of the cited references describes this and event the Examiner has not identified this limitation in the cited references. Furthermore, the cited references do not teach computing estimate of noise associated with the first type of carrier signal. In contrast, the cited references describe calculating the noise for the entire data block. In fact the cited sections of Raleigh relate to "applying SINR criteria to a block of received data" (*see* col. 13, lines 3-56). Acordingly, claim 14 is further patentably distinguishable from the combination of cited references.

Claim 15 depends from claim 14 and is patentably distinguishable from the combination of cited references for at least the same reasons as claim 14.

Claim 16 has been rejected in the manner of claim 1. Accordingly, claim 16 is patentably distinguishable from the combination of cited references for at least the same reasons as claim1.

Further, Applicant respectfully requests a careful reading of claim 16. Claim 16 recites a system with various elements for example, at least a first input, second input, a selector, and a beamformer and further recites functions for each of these elements. The Examiner has not identified any reference that describes these elements with functions as recited therein such as the first input receives an indication of channel estimates and the second input receives an indication of estimated noise for a plurality of training tones of the received data burst. Thus, the cited references do not teach, suggest, or describe all limitations of claim 16 and claim 16 is further patentably distinguishable from the combination of cited references.

Claim 17 depends from claim 16 and is patentably distinguishable from the combination of cited references for at least the same reasons as claim 16.

Claim 18 has been rejected in the manner of claim 16. Accordingly, claim 18 is patentably distinguishable from the combination of cited references for at least the same reasons as claim 16.

Claims 19-24 depend from claim 18 and are patentably distinguishable from the combination of cited references for at least the same reasons as claim 18.

Claim 25 has been rejected as a method performed by the device of the claim 16. Accordingly, claim 25 is patentably distinguishable from the combination of cited references for at least the same reasons as claim 16.

Claims 26-32 depend from claim 25 and are patentably distinguishable from the combination of cited references for at least the same reasons as claim 25.

Claim 15 is rejected under 3.5 U.S.C. 103(a) as being unpatentable over Youssefmir et al. (6795409) and Raleigh (6006110) as applied to claim 14, and further in view of Tellado et al. (6711412). Applicant respectfully traverses this rejection.

Claim 15 depends from claim 14, which has been distinguished from the combination of Youssefmir et al. and Raleigh for failing to disclose all limitations for claim 14. Therefore the combination of Youssefmir et al., Raleigh, and Tellado et al. cannot render claim 15 obvios.

Applicant believes this application and the claims herein to be in a condition for allowance. Should the Examiner have further inquiry concerning these matters, please contact the below named attorney for Applicant.

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